If you are using a printed copy of this procedure, and not the on-screen version, then you MUST make sure the dates at the bottom of the printed copy and the on-screen version match.
The on-screen version of the Collider-Accelerator Department Procedure is the Official Version.
Hard copies of all signed, official, C-A Operating Procedures are kept on file in the C-A ESHQ Training Office, Bldg. 911A.

C-A OPERATIONS PROCEDURES MANUAL

7.1.42 Cold Turbines "A" Train Initialization

Text Pages 2 through 5

Hand Processed Changes

HPC No.	Date	Page Nos.	Initials

Approved: _____***Signature on File***_____ _____
Collider-Accelerator Department Chairman Date

D. Lederle

7.1.42 Cold Turbines "A" Train Initialization

1. Purpose

To provide instruction on preparing the turbines for start up, this includes the start up of the oil skids.

2. Responsibilities

2.1 The Shift Supervisor, or an Operator designated by the Shift Supervisor, is responsible for conducting the procedure and providing documentation in the Cryogenic Control Room Log.

2.2 Should a problem arise during the turbine initialization, the Shift Supervisor will report to the Technical Supervisor for instructions before continuing.

3. Prerequisites

3.1 Turbines have been regenerated.

3.2 Turbines have been purged per C-A-OPM 7.1.27, "Expander Purge Procedure."

3.3 Seal gas compressor running per C-A-OPM 7.1.23, "Seal Gas Compressor Startup."

4. Precautions

4.1 If there is liquid helium in the refrigerator pots, all personnel entering the refrigeration wing of Bldg. 1005R must be ODH Class 1 qualified, have a Personal Oxygen Monitor (POM), and carry an emergency escape pack.

5. Procedure

_____ 5.1 Date_____.

_____ 5.2 Ensure the turbine inlet valves H385A____ and H402A____ are closed.

_____ 5.3 Ensure the turbine outlet valve H410A____ is closed.

_____ 5.4 Ensure the interstage valve H397M____ is open.

Note:
The procedure assumes that both turbine inlet filters are clean. If a filter is not clean, that filter shall remain isolated.

_____ 5.5 If placing inlet filter "A" online, complete the following:

5.5.1 Open outlet valve H9161M____ and inlet valve H9158M____.

5.5.2 Close "B" filter outlet valve H9152M____ and open inlet valve H9150M____ as a sign that "B" filter is ready for service.

_____ 5.6 If placing "B" inlet filer online, complete the following:

5.6.1 Open outlet valve H9152M____ and inlet valve H9150M____.

5.6.2 Close "A" filter outlet valve H9161M____ and open inlet valve H9158M____ as a sign that "A" filter is ready for service.

_____ 5.7 Unless otherwise instructed, do not adjust expander brake needle valves E897M and E901M. They are used for fine control of the turbine speed and are normally set to the correct position.

_____ 5.8 Align turbine 5/6 oil sump to the seal gas compressor by opening valve H1241M.

_____ 5.9 Align turbine 5A/6A drainer gas return by opening valves H1242M_____ and H1243M_____.

_____ 5.10 Ensure the following isolation valves located near the turbine 5A/6A pod are open:

E915M____	E916M____
E903M____	E896M____
H1246M____	E900M____
H1247M____	E909M____
H1250M____	E904M____

_____ 5.11 Ensure 120 VAC circuit breaker #7 in panel RP-2 (located next to CB3 and CB5 calorimeter local control panels) is closed.

_____ 5.12 Remove mechanical brake assemblies from turbines 5A and 6A as per C-A-OPM 7.1.26 "Expander Brake System Installation and Removal."

_____ 5.13 Ensure the following 480 VAC circuit breakers (panel located on east wall of lower level) are closed:

Subsection E:
Breaker #2____ Turbine Oil System #3, Pump #1
Breaker #3____ Turbine Oil System #3, Pump #2

_____ 5.14 Open turbine oil skid 5/6 control air supply valve A203M_____ and adjust turbine 5A/6A air regulator PR9340A to 30 psig_____.

_____ 5.15 Ensure the following valves at turbine 5A/6A oil skid are closed:

E925M____	E902M____
E927M____	E911M____
E921M____	

_____ 5.16 Ensure the cooling water return valve W918M____ and supply valve W903M____ for turbine 5/6 oil skid are open.

_____ 5.17 Ensure the following valves located on turbine 5A/6A oil skid are open:

W973M____	E929M____
W971M____	E931M____
E996M____	E924M____
E997M____	E922M____
E998M____	E905M____
E1010M____	H10779M____

_____ 5.18 Ensure the following vent valves for turbines 5A/6A are closed:

H9182M____	H9190M____
H9184M*____	H9192M*____
H395M____	H412M____
H695M*____	

*If found open, investigate and be suspect of air contamination.

_____ 5.19 On turbine 5A/6A oil skid, depress “Lamp Test” button to ensure all lamps work.

_____ 5.20 On turbine 5A/6A oil skid, start seal gas flow and oil pump as follows:

5.20.1 Depress “Annunciator Acknowledge” button____.

5.20.2 Set seal gas pressure to approximately 200 psig by adjusting seal gas differential pressure regulator. Verify seal gas flow in flow meter_____.

5.20.3 Select primary oil pump by placing “Pump Select” switch to “No. 1” or “No. 2”____.

Caution:
To prevent oil migration, do not send oil to the expander unless immediate expander startup is anticipated.

Note:
If turbine train "B" is operating, it will be necessary to jog the switch in the following step to avoid starving "B" train of oil.

5.20.4 Send oil to expander by placing "Lube Oil Selector" switch to "Unit 5A/6A"____.

5.20.5 Verify all faults cleared and "Expander Ready" light is lit____.

5.20.6 Ensure "Local/Computer switch is in "computer" _____.

Caution:
1. To prevent overspeed of turbines the system pressure must be less than 7 atm prior to turbine start up.
2. Following turbine start up, back wheel pressure must be greater than drainer pressure. This will prevent oil migration

6. Documentation

6.1 The check off lines on the procedure are for the place keeping only. The procedure is not to be initialed or signed, it is not a record.

6.2 The Shift Supervisor, or designee, shall document the completion of the procedure in the Cryogenics Control Room Log.

7. References

7.1 C-A-OPM 7.1.23, "Seal Gas Compressor Startup".

7.2 C-A-OPM 7.1.26, "Expander Brake System Installation and Removal".

7.3 Drawing 3A995009, 25KW Helium Refrigerator P&ID.

7.4 Drawing 3A995705, Cold Expanders 5 and 6 System Schematic.

8. Attachments

None